

## CLINICAL REPORT

# Effectiveness of a Multidisciplinary Itch-coping Training Programme in Adults with Atopic Dermatitis

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**The short- and longer-term effectiveness of a brief, multidisciplinary itch-coping group training scheme in adults with atopic dermatitis was evaluated. Clinical severity scores (Eczema Area and Severity Index) and validated self-report measures were obtained in a waiting-list control condition ( $n=30$ ) and a treatment condition ( $n=61$ ) at pre- and post-treatment and in the treatment condition at 3- and 12-month follow-ups. Relative to the control condition, all post-treatment measures showed improvements in terms of enhanced skin status, reduced itching and scratching and improved itch-coping patterns. In the treatment condition, the changes were sustained or further improved at both follow-ups. Also, the dermatological healthcare use was significantly reduced during the follow-up periods, in terms of fewer visits to the dermatologist and decreased use of topical corticosteroids and itch-relieving medication (histamine antagonists). The brief multidisciplinary itch-coping programme in adults with atopic dermatitis considerably reduced itch-scratching patterns, improved their skin status and reduced the use of dermatological care, both in the short and longer term. *Key words: itch; scratching; cognitive behaviour therapy; atopic dermatitis; quality of life.***

(Accepted May 9, 2008.)

Acta Derm Venereol 2009; 89: 57–63.

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Chronic itch is the main symptom of atopic dermatitis (AD) (1–8). As an adjunct to standard dermatological care, multidisciplinary itch-coping programmes have been developed (9–12; see 13 for a review). These programmes usually make use of a broad scope of cognitive-behavioural methods for the reduction of itch and scratching behaviour, including self-monitoring, guidance in skin care and coping skills to manage itch- and scratch-triggering factors, stress-management methods with relaxation techniques and habit reversal (9–12, see 13 for a review). Our group has developed a concise multidisciplinary group training itch-coping scheme for adults with AD. We needed to demonstrate

the programme's efficacy in the short and longer term. The main goals of the present study were:

- to compare the effects of the brief multidisciplinary itch-coping programme in a cohort of adult AD patients with a waiting-list control condition on the primary outcome measures itch, and the secondary outcome measures skin severity, scratching behaviour, itch-coping patterns, illness cognitions and health-related quality of life;
- to determine the changes at 3 and at 12 months after treatment completion in the primary and secondary outcome measures as well as in the use of dermatological care.

## METHODS

### *Patients and procedure*

The study includes a treatment evaluation ( $n=61$ ) during four assessment points: pre- and post-treatment and 3 and 12 month follow-up assessments. In addition, changes during treatment are compared with a waiting-list control condition ( $n=30$ ) during 3 months.

For the treatment condition, data were available for 61 patients. Inclusion criteria were: age 16 years or older, and a diagnosis of AD with itch-scratching problems. Exclusion criteria were: severe physical or psychiatric co-morbidity that was likely to interfere with the training, insufficient command of the Dutch language, unwillingness to participate in a group context and lack of itch or scratching symptoms during the previous 3 months. Patients had a mean age of 37.0 years (standard deviation (SD) 13.7, range 17–70 years) and 68% were women. Sixty percent were married and 60% had completed up to 12 years of formal education. The group's mean duration of illness was 23.1 years (SD 17.8; range 0–67 years). As part of the intake procedure, patients were asked to participate in the study and to complete self-report inventories and clinical assessments on four separate occasions, i.e. before and after the training programme and at a 3- and a 12-month follow-up. Thirty patients had additionally entered a waiting list of (at least) 3 months. At the start and end of this period they completed two assessments, the outcomes of which were used to compare them with the pre-post-treatment assessments of the treatment group ( $n=61$ ).

### *Multidisciplinary itch-coping programme*

Each group programme included between five and eight participants and was delivered by two therapists: a clinical psychologist/cognitive behaviour therapist together with a dermatology nurse specialist, in adjunct to the patients' regular visits to their dermatologist. The therapists were specifically trained in group therapy as well as itch-scratching cognitive-behavioural meth-

ods, based on a written patient manual (see Table I). The group programme comprised four 2-weekly sessions and one booster session one month after treatment end (all conducted within a 3-month period), followed by one individual booster session 3 months later. During treatment, all participants were given a booklet containing information about the programme's content and exercises and the daily homework assignments (requiring approximately 1 h). To secure an optimal commitment, participants were also encouraged to look for at least one involved significant person in their immediate environment to support them throughout the training programme. The protocol was based on existing cognitive-behavioural programmes that had been shown to be effective in enhancing itch-coping skills and reducing scratching behaviour. The methods included self-monitoring, improving skin-care management, coping techniques to deal with triggering factors of itching and scratching, stress-management and habit reversal (9–13). In each session (duration 2 h) both itch- and scratch-related issues were addressed. Table I provides a schematic overview of the programme.

### Outcome measures

The following validated clinical and self-reported measures were completed at all assessments:

A clinical evaluation of skin severity was performed by an independent, trained research assistant who was blind to the study protocol using the validated Eczema Area and Severity Index (EASI), which includes the total affected body area and signs of skin severity of erythema, induration/papulation, excoriation, and lichenification for patients with AD (14).

Skin status was measured with the skin-status scale of the Impact of Chronic Skin Disease on Daily Life (ISDL), a multi-dimensional self-inventory of health status for patients with chronic skin diseases that reflects physical, psychological and social-health aspects (1, 2). All ISDL scales relevant for itch-coping problems (9 out of 14 scales) were used in the present study. The skin status scale assesses the current extent and severity of the skin condition for nine different body parts (face, hairy scalp, neck, hands, arms, torso, legs, feet and genitals/anus). The sum score reflects the overall severity of the skin condition.

Itch was assessed with the 4-item itch scale of the ISDL (2) to establish the intensity and duration of the itch complaints during the past 4 weeks. For AD, a Cronbach's alpha of 0.83 has been reported (1, 2).

Scratch responses were assessed with three ISDL scales (2): (i) conscious scratching to evaluate the frequency and duration of the scratching behaviour (3 items); (ii) automatic scratching to gauge scratching behaviour to non-itching stimuli and unconscious scratching behaviour (e.g. scratching in the absence of itch or without being aware of it; 3 items); and (iii) scratching at night to determine the frequency of scratching behaviour during sleep (1 item). For the conscious and automatic scratch-

ing scales Cronbach's alphas of 0.73 and 0.64, respectively, have been reported in AD (2).

Itch-coping patterns were evaluated by means of two scales derived from self-report tools used in chronic pain research. The 6-item itch-efficacy scale was adapted from the Arthritis-Self-Efficacy questionnaire (ASE; 15) and the 13-item itch-catastrophizing scale from the Pain Catastrophizing Scale (PCS) (16) by replacing the word "pain" by "itch" in the relevant places. Cronbach's alphas for both scales were 0.78 and 0.93, respectively.

Health-related quality of life was assessed with the Disease Impact on Daily Life scale of the ISDL (also referred to as *daily-life impact*; 1, 2). This 10-item generic scale measures the effect the condition has on activities of daily life including work, hobbies, holiday, sleep, sexuality, eating and relationships. A Cronbach's alpha of 0.87 has been reported for AD (2). We also assessed disease-related quality of life with a Dutch version of the DLQI (Dermatological Life Quality Index (DLQI); 17), a 10-item scale measuring the impact of skin diseases on several physical, psychological and social aspects of daily life, with a Cronbach's alpha of 0.86.

Illness Cognitions were appraised using three chronic-disease-related cognitions of the ISDL (2, 18): helplessness (6 items), acceptance (6 items) and perceived benefits (6 items), with Cronbach's alphas in AD of 0.88, 0.93 and 0.85, respectively (1, 2, 18).

Dermatological care use was assessed with a self-report questionnaire that gauges the patient's healthcare consumption by asking about the number of outpatient visits to their dermatologist during the past 3 months and referrals for treatment at our day clinic or inpatient stays at the dermatology department. Patients also detailed the prescribed medication they had used during the past 3 months, including topical corticosteroids (classified in accordance with the British National Formulary (19) into mild, moderately potent, potent and very potent), and itch-relieving medication (histamine antagonist).

### Statistical analyses

Differences between drop-outs and completers, responders and non-responders, as well as between the control and treatment condition at pre-treatment, were tested with  $\chi^2$  analyses and Student's *t*-tests with a threshold of  $p < 0.05$  (two-tailed).

For evaluation of the treatment, we conducted analyses of covariance (ANCOVA) to assess changes in the treatment and control conditions as to the primary outcomes of itch and secondary outcomes of skin severity, scratching behaviour, itch-coping patterns, health-related quality of life and illness cognitions, using the baseline measures of the treatment and waiting list control condition as covariates. Paired *t*-tests were subsequently conducted on the primary and secondary outcomes separately for both conditions.

ANOVA with repeated measurements was conducted for all assessment points of the treatment condition (pre- and post-treatment and 3 and 12 month follow-up). In addition, paired *t*-tests and Wilcoxon signed-rank test between the pre-treatment and both the 3- and 12-month follow-up data were also performed on the primary and secondary outcomes and dermatological care to explore the changes from pre-treatment to follow-up assessments.

To gain insight into the magnitude of effects, moderate (about 0.50) and large (about 0.70) effect sizes were used as possible indicators of clinically relevant changes, which were calculated by the difference between the means of the various measurements divided by their pooled SD (20). To establish the number of patients with clinically significant improvements, we computed the percentages of patients that had improved at least 25% in the EASI scores as well as the proportion of patients having reached significant skin clearance in the EASI score (in terms of  $< 10\%$  of the skin being affected) for all assessments.

Table I. Overview of the content of the treatment manual and sessions of the multidisciplinary itch-coping training programme

	Theme 1	Theme 2
Session 1	Introduction	Registration and self-monitoring
Session 2	Skin care	Habit reversal
Session 3	Itch-triggering factors	Scratch-triggering factors
Session 4	Stress-management	Long-term goals and relapse prevention
Booster session	Long-term goals and relapse prevention	

During the treatment evaluation, pre-to-post-treatment data of 61 patients and for the 3 and 12 month follow-up data of 55 and 40 patients were available, respectively. The missing follow-up data are due to ongoing data collection (4 and 9 patients for the 3 and 12 months follow-up, respectively). The two other non-responders at first follow-up had developed physical co-morbidities during the 3-month period. Of the non-responding patients at the second follow-up, five had developed physical co-morbidity during the later 12 months follow-up period and three had moved; of the other four the reason for not responding could not be established.  $\chi^2$  and  $t$ -tests of the pre-treatment data between responders and non-responders revealed no significant differences between the two groups with regard to any of the demographic variables (sex, age, educational level, marital status), disease duration or primary and secondary outcome measures. All treatment analyses were consequently conducted on the full pre-to-post data sets ( $n=61$ ) and the complete pre-to-follow-up data sets of the treatment condition ( $n=40$ ). Since both methods revealed the same overall results, only the results of the complete pre-to-follow-up data sets of the treatment condition ( $n=40$ ) are presented.

## RESULTS

### *Drop-outs and pre-treatment comparisons*

Only two of 61 patients (3%) dropped out during the programme, both due to insufficient motivation to continue with the training because of their relatively low itch levels. Attendance of sessions was generally high for patients, since at least 4 of the 5 group sessions and the individual session were attended by more than 90% of the patients.

Table II lists the means and SDs of all primary and secondary outcome measures for the treatment and control conditions separately. Baseline comparisons revealed no significant differences between the two conditions on any of the demographic variables or measures, duration of disease or primary and secondary outcome measures.

### *Changes during treatment*

ANCOVA for the two conditions (treatment vs. waiting list control condition) revealed significant F-changes on the primary outcome of itch and the secondary outcome of the clinical and subjective measures of skin severity, scratching behaviour, itch-coping patterns (self-efficacy, catastrophizing) and illness cognitions (acceptance, perceived benefits) for the treatment condition relative to the control condition (see Table II). No significant differences were found for both health-related quality of life measures (ISDL impact and DLQI).

When examining the nature of the changes in both conditions, the paired  $t$ -tests of the pre- and post-treatment data in the treatment condition further showed that the primary outcome of itch in the treatment condition had significantly decreased. This was also the case for all secondary outcomes: clinical and self-reported outcomes

of skin severity and scratching behaviour (conscious and automatic scratching, scratching at night) had decreased, itch-coping patterns had improved through increased self-efficacy and decreased catastrophizing, health-related quality-of-life scores (ISDL impact and DLQI) were higher and patients had acquired more beneficial illness cognitions in terms of a decrease in helplessness and a rise in acceptance and perceived benefits (see Table II). In contrast, none of these measures showed any significant changes for the patients during the waiting-list period.

### *Changes at 3- and 12-month follow-ups*

Long-term changes for the treatment condition were explored by ANOVA with repeated measurements for the treatment condition during all four assessment points (pre- and post-treatment and 3- and 12-month follow-up assessments). Results indicated significant changes for the treatment group in all primary and secondary outcome measures (see Table III): patients in the treatment condition significantly improved with regard to itch, clinical and self-report measures of skin severity, scratching responses, itch-coping patterns, illness cognitions and health-related quality of life (DLQI and ISDL impact). In addition, the paired  $t$ -tests between the pre-treatment and the two follow-up data sets yielded almost the same significant changes as the pre-to-post-treatment analyses had yielded, indicating sustained improvements or even further augmentation of earlier improvements during the 3 and 12 months following treatment completion (see Table III). This means patients in the treatment condition significantly improved on all primary and secondary outcome measures of clinical and self-report measures of skin severity, itch, scratching responses, itch-coping patterns, illness cognitions and health-related quality of life at both the 3- and 12-month follow-up assessments.

Additional analyses of the changes in the extent of dermatological care showed that the number of dermatological outpatient consultations was significantly reduced during both follow-up periods relative to the pre-treatment outcomes ( $p<0.001$  for both periods; see Table IV). The same was true for the incidence of dermatological day care: referrals to the day clinic had significantly decreased during both follow-up periods ( $p<0.001$  for both periods, respectively), which implied that none of the patients had received such care. Only one patient was referred to an inpatient stay during the 3-month follow-up and none received such care during the 12-month follow-up. The use of itch-relieving medication or topical corticosteroids had also not changed significantly after three months. However, the 12-month follow-up did reveal significant drops in the use of itch-relieving medication (histamine antagonist) ( $p<0.01$ ) and decreased use of topical corticosteroids ( $p<0.05$ ).

Table II. Mean and standard deviation (SD) for the treatment condition (TC) and waiting-list control condition (CC) for the primary and secondary outcome measures during pre- and post-treatment

		Pre-treatment Mean (SD)	Post-treatment Mean (SD)	F-value <sup>1</sup>	T-value <sup>2</sup>
<i>Skin severity</i>					
EASI score	TC	7.73 (6.80)	6.27 (5.84)	5.50 <sup>a</sup>	2.53 <sup>a</sup>
	CC	8.39 (7.80)	9.28 (10.39)		−0.83
Skin status	TC	17.73 (3.69)	15.92 (2.92)	4.44 <sup>a</sup>	3.37 <sup>b</sup>
	CC	16.38 (2.90)	16.73 (3.41)		−0.59
Itch	TC	10.64 (2.98)	8.20 (2.54)	6.23 <sup>a</sup>	5.09 <sup>c</sup>
	CC	10.36 (3.46)	9.58 (3.10)		1.50
<i>Scratch responses</i>					
Conscious scratching	TC	8.53 (2.80)	6.63 (2.95)	5.36 <sup>a</sup>	3.81 <sup>c</sup>
	CC	7.62 (2.99)	7.94 (2.97)		−0.47
Automatic scratching	TC	5.97 (2.32)	4.66 (1.77)	7.31 <sup>b</sup>	3.50 <sup>c</sup>
	CC	5.44 (2.04)	5.73 (2.29)		−0.66
Scratching at night	TC	2.32 (1.07)	1.79 (0.96)	4.48 <sup>a</sup>	3.77 <sup>c</sup>
	CC	2.29 (1.16)	2.25 (1.11)		0.17
<i>Itch-coping-patterns</i>					
Itch self-efficacy	TC	14.41 (4.54)	19.26 (4.57)	15.41 <sup>c</sup>	−6.08 <sup>c</sup>
	CC	15.31 (4.54)	15.4 (5.05)		−0.17
Itch catastrophizing	TC	23.60 (9.71)	17.18 (9.44)	5.24 <sup>a</sup>	5.42 <sup>c</sup>
	CC	19.58 (8.50)	18.83 (11.34)		0.42
<i>Health-related quality of life</i>					
Impact disease daily life	TC	22.39 (6.20)	20.25 (6.03)	0.42	3.71 <sup>c</sup>
	CC	21.69 (5.08)	20.32 (6.29)		1.17
Dermatology Life Quality (DLQI)	TC	10.61 (6.82)	8.51 (5.00)	0.73	2.39 <sup>a</sup>
	CC	9.50 (6.32)	9.32 (7.06)		0.10
<i>Illness cognitions</i>					
Helplessness	TC	12.18 (4.15)	11.11 (3.00) <sup>a</sup>	0.04	2.07 <sup>a</sup>
	CC	12.00 (3.12)	10.96 (4.08)		1.79
Acceptance	TC	13.74 (3.74)	15.47 (3.48) <sup>b</sup>	8.52 <sup>b</sup>	−3.45 <sup>c</sup>
	CC	15.00 (4.07)	13.92 (4.27)		1.44
Perceived benefits	TC	11.08 (3.46)	12.43 (4.11) <sup>b</sup>	6.18 <sup>a</sup>	−3.24 <sup>b</sup>
	CC	12.00 (3.70)	11.52 (3.63)		0.88

<sup>a</sup> $p < 0.05$ ; <sup>b</sup> $p < 0.01$ ; <sup>c</sup> $p < 0.001$ .<sup>1</sup>F-value: analyses of covariance effects between TC and CC.<sup>2</sup>T-value: paired *t*-tests for differences between pre- and post-treatment scores for the TC and waiting list CC.

EASI: Eczema Area and Severity Index.

### Effect sizes and clinically significant improvements

With regard to the magnitude of the observed changes in the outcome measure itch and skin severity in the treatment condition (see Table V), effect sizes indicated medium to large post-treatment and 3 and 12 month follow-up effects for skin severity (between 0.46 and 0.85) and itch (between 0.88 and 1.37), whereas in the control condition the data reflected only small improvements or a worsening of symptoms (skin severity -0.11; itch 0.24) (20). In terms of number of patients with clinical significant changes of the affected skin, the EASI area scores had improved at least 25% in the treatment condition in 39–56% of the patients at post-treatment and the 3 and 12 month follow-ups, respectively, in contrast to an improvement of not more than 21% in the control condition. As to post-treatment and at 3 and 12 months follow-ups, there was skin clearance (affected area score < 10%) in 47–52% of the patients in the treatment condition at the different assessment points vs. 28% in the control condition.

### Patient satisfaction

At the end of the fifth group (booster) session, patients were asked to complete an evaluation form. The scores on a 4-point Likert scale indicated that the patients were highly satisfied with the overall training programme ( $M = 3.71$ ;  $SD = 0.46$ , range 1–4). They also rated the relevance of the various programme components separately (1 = not important, 4 = very important) and indicated the following elements as most important: skin care ( $M = 3.48$ ;  $SD = 0.73$ , range 1–4), identification of and coping with itching and scratching triggering factors ( $M = 3.28$ ;  $SD = 0.77$ , range 1–4), habit reversal ( $M = 3.10$ ;  $SD = 0.79$ , range 1–4), and self-monitoring of itch and scratching behaviour ( $M = 3.02$ ;  $SD = 0.81$ , range 1–4). They also gave relatively high importance ratings on the 6-point Likert scales for multidisciplinary team ( $M = 5.52$ ;  $SD = 0.80$ , range 1–6), the group character of the training ( $M = 5.23$ ;  $SD = 1.07$ , range 1–6), the patient booklet ( $M = 4.98$ ;  $SD = 0.98$ , range 1–6) and the homework assignments ( $M = 4.16$ ;  $SD = 1.28$ , range 1–6).

Table III. Mean and standard deviation (SD) for the treatment condition (TC) at all four assessments points for the primary and secondary outcome measures

	Pre-treatment Mean (SD)	Post-treatment Mean (SD)	3-month follow-up Mean (SD)	12-month follow-up Mean (SD)	F-value <sup>1</sup>	T-value <sup>2</sup> 3-month follow-up	T-value <sup>2</sup> 12-month follow-up
<i>Skin severity</i>							
EASI score	7.73 (6.80)	6.27 (5.84)	5.11 (3.49)	5.66 (5.46)	3.46 <sup>a</sup>	2.02 <sup>a</sup>	2.07 <sup>a</sup>
Skin status	17.73 (3.69)	15.92 (2.92)	16.12 (3.34)	14.77 (3.17)	5.97 <sup>b</sup>	2.93 <sup>b</sup>	4.68 <sup>c</sup>
Itch	10.64 (2.98)	8.20 (2.54)	8.05 (2.86)	6.95 (2.41)	11.43 <sup>c</sup>	3.96 <sup>c</sup>	5.72 <sup>c</sup>
<i>Scratch responses</i>							
Conscious scratching	8.53 (2.80)	6.63 (2.95)	6.16 (2.87)	5.05 (2.72)	11.59 <sup>c</sup>	3.64 <sup>c</sup>	6.18 <sup>c</sup>
Automatic scratching	5.97 (2.32)	4.66 (1.77)	4.88 (1.95)	4.26 (1.86)	7.96 <sup>c</sup>	2.87 <sup>b</sup>	4.69 <sup>c</sup>
Scratching at night	2.32 (1.07)	1.79 (0.96)	1.68 (0.85)	1.61 (0.94)	6.86 <sup>c</sup>	3.72 <sup>c</sup>	3.80 <sup>c</sup>
<i>Itch-coping-patterns</i>							
Itch self-efficacy	14.41 (4.54)	19.26 (4.57)	20.64 (4.77)	20.27 (4.52)	18.56 <sup>c</sup>	-7.30 <sup>c</sup>	-6.09 <sup>c</sup>
Itch catastrophizing	23.60 (9.71)	17.18 (9.44)	14.29 (9.76)	11.70 (9.36)	18.31 <sup>c</sup>	6.23 <sup>c</sup>	6.96 <sup>c</sup>
<i>Health-related quality of life</i>							
Impact disease daily life	22.39 (6.20)	20.25 (6.03)	19.29 (5.88)	17.70 (5.62)	14.71 <sup>c</sup>	4.40 <sup>c</sup>	7.09 <sup>c</sup>
Dermatology Life Quality (DLQI)	10.61 (6.82)	8.51 (5.00)	6.89 (5.44)	6.24 (5.30)	5.15 <sup>b</sup>	3.45 <sup>c</sup>	4.02 <sup>c</sup>
<i>Illness cognitions</i>							
Helplessness	12.18 (4.15)	11.11 (3.00)	10.66 (3.39)	10.18 (3.64)	3.45 <sup>a</sup>	3.25 <sup>b</sup>	3.49 <sup>c</sup>
Acceptance	13.74 (3.74)	15.47 (3.48)	16.63 (4.00)	16.94 (3.74)	4.62 <sup>b</sup>	-3.99 <sup>c</sup>	-4.13 <sup>c</sup>
Perceived benefits	11.08 (3.46)	12.43 (4.11)	13.52 (5.09)	13.51 (5.12)	5.97 <sup>b</sup>	-4.38 <sup>c</sup>	-3.79 <sup>c</sup>

<sup>a</sup> $p < 0.05$ ; <sup>b</sup> $p < 0.01$ ; <sup>c</sup> $p < 0.001$ .<sup>1</sup>F-value: analyses of covariance with repeated measurements for the TC during all assessment points.<sup>2</sup>T-value: paired *t*-test for the TC for differences between pre-treatment scores with scores at the 3- and 12-month follow-ups.

EASI: Eczema Area and Severity Index.

## DISCUSSION

Itch and related scratching problems constitute a major problem in patients with AD (1–8). On the basis of multidisciplinary itch treatment schemes (9–13), in the present study we examined the short- and longer-term effectiveness of a brief, multidisciplinary group

treatment aimed at enhancing the itch-coping skills for patients with AD.

The results showed the training programme to be effective in comparison with a waiting list control condition. Moreover, both the clinical and self-reported skin-status measures showed a significant reduction in the area of affected skin and skin severity at all measurements, with at least 25% improvement and/or clearance in more than half of the patients at 12 months follow-up. Also the other secondary outcome measures reflected clear improvements: all modes of scratching responses (conscious, automatic and night-time scratching) had decreased, itch-coping patterns had improved in that itch-related self-efficacy was enhanced and itch catastrophizing reduced; changes in illness cognitions had been achieved as reflected by the higher levels of acceptance and perceived benefits; and health-related quality of life was rated higher on all areas of daily living (work and leisure time, social activities or relationships).

With our study we have extended earlier findings by showing that even a very brief, multidisciplinary treatment scheme for patients suffering from AD com-

Table IV. Pre-treatment-to-follow-up changes of the treatment condition in the use of dermatological care

	Pre-treatment	3-month follow-up	12-month follow-up
<i>Dermatological consultations</i>			
Dermatologist outpatient visits, mean (SD)	4.73 (6.49)	1.87 (2.59)	0.74 (0.82)
Dermatology day-clinic treatment (% of patients)	30	0	0
Dermatology inpatient stay (% of patients)	8	3	0
<i>Medication and ointments</i>			
Topical corticosteroids, mean (SD)	2.55 (1.11)	2.35 (1.21)	2.28 (1.30)
No (% of patients)	12	18	21
Mild (% of patients)	0	0	0
Moderately potent (% of patients)	18	20	20
Potent (% of patients)	60	55	49
Very potent (% of patients)	10	7	10
Systematic medication (% of patients)	5	3	3
Itch-relieving medication (histamine antagonist) (% of patients)	60	53	33

SD: standard deviation.

Table V. Effect sizes and clinical significant changes at post-treatment and both follow-up assessments in the treatment condition

	Effect size		Clinical significant changes	
	Skin severity	Itch	25% skin improvement	Skin clearance (%)
Post-treatment	0.55	0.88	43%	47
3-month follow-up	0.46	0.89	39%	49
12-month follow-up	0.85	1.37	56%	52

prising a cognitive-behavioural training module can considerably improve the outcome for patients. The presented follow-up results demonstrated that the post-treatment improvements were not only sustained but had even increased, with the largest effects on skin severity and itch and scratching behaviour being observed at 12 months. The effect sizes on the primary outcome parameters generally fell within the range of clinical significance. Accordingly, this brief, multidisciplinary group treatment can be considered to be successful for adults with AD and is at least as effective as other, more extensive multidisciplinary treatments (10–13).

Our treatment programme also induced a significant reduction in the number of dermatological consultations and day-treatments, both after 3 and after 12 months, as well as in the number of prescriptions for itch-relieving medication and topical corticosteroids at 12 months. Only one earlier study evaluating a 10-session outpatient itch programme had reported a similar drop in the use of topical corticosteroids at the 12 month follow-up (10). The changes we found in the patients' consumption of dermatological care are particularly relevant considering the concise multidisciplinary group treatment and the possible cost-effectiveness of this treatment approach. The attrition rate for the intervention was low (3%) and patients were highly committed to and satisfied with the programme.

Several limitations of our study need to be taken into account. Obviously, using a waiting list control condition means both a lack of randomization and a lack of control data at follow-up, as it is usually applied in innovative, clinical evaluation research that has preferably to be followed by a multi-centre, randomized trial (21). Due to this explorative character of the results of a non-randomized trial, the promising findings have to be interpreted with caution. However, comparison with the drop-outs and non-responders seemed to rule out any selection bias of the treatment sample. Although the programme reduced the patients' healthcare consumption after one year, these are only preliminary indicators of the programme's long-term efficacy and future, longitudinal studies should directly look at its cost-effectiveness in relation to other areas of daily living. It is also important to evaluate whether the group treatment is effective for patients with chronic pruritus caused by other diseases than AD. To date, studies on multidisciplinary itch programmes have only incidentally evaluated other populations, e.g. urticaria, nodular prurigo or psoriasis (11, 13). The training programme is currently being studied in various other patient groups, and the preliminary results for patients suffering from chronic itch due to psoriasis point to similar effects as those obtained in our AD sample. In addition, the possible mediating and moderating effects of this and other treatment process factors and the critical working mechanisms of our and other itch-coping group train-

ing programmes merit further elaboration (22). When focusing on cost-effectiveness issues, tailoring training schemes to the needs of specific patient groups or individual patients is another key issue in clinical practice. Among these developments are targeted programmes that address specific stress-triggering mechanisms of chronic pruritus and e-health applications (programmes offered on the internet) for patients with more moderate itch and scratch problems (23, 24).

In conclusion, the present study demonstrates that a brief multidisciplinary group itch-coping programme for patients with AD can considerably improve the patients' skin status, modify their itching and scratching patterns, enhance health-related quality of life and reduce the consumption of dermatological care in both the short and the longer term and implementation of the programme can be recommended for patients with AD.

## ACKNOWLEDGEMENTS

We would like to thank Hanneke Metsers, Wilma van de Hoek, and Alice de Bie for their significant contribution to the itch-coping programme and Bas te Winkel, Koen te Winkel, and Ria te Winkel for data entry.

## REFERENCES

1. Evers AWM, Lu Y, Duller P, van der Valk PGM, Kraaimaat F, van de Kerkhof PCM. Common burden in chronic skin disease? Contributors to psychological distress in adults with psoriasis and atopic dermatitis. *Br J Dermatol* 2005; 152: 1275–1281.
2. Evers AWM, Duller P, van de Kerkhof PCM, van der Valk PGM, Gerritsen MJ, de Jong E, et al. The impact of chronic skin diseases on daily life (ISDL): a generic and dermatology specific health status instrument. *Br J Dermatol* 2008; 158: 101–108.
3. Stangier U, Ehlers A. Stress and anxiety in dermatological disorders. In: DI Mostofsky, DH Barlow, editors. *The management of stress and anxiety in medical disorders*. Needham Heights, MA: Allyn and Bacon, 2000: p. 304–343.
4. Stangier U, Ehlers A, Gieler U. Measuring adjustment to chronic skin disorders: validation of a self-report measure. *Psychol Assess* 2003; 15: 532–549.
5. Verhoeven EWM, Kraaimaat FW, van Weel C, van de Kerkhof PCM, van der Valk PGM, Duller P, et al. Psychosocial consequences of skin disease in general practice. *J Eur Acad Dermatol Venereol* 2007; 21: 662–668.
6. Verhoeven EWM, Kraaimaat FW, van Weel C, van de Kerkhof PCM, van der Valk PGM, Duller P, et al. Prevalence of physical symptoms of itch, pain and fatigue in skin diseases in general practice. *Br J Dermatol* 2007; 156: 1346–1349.
7. Verhoeven EWM, Kraaimaat FW, Duller P, Kerkhof PCM van de, Evers AWM. Cognitive, behavioral and physiological reactivity of chronic itching: analogues to chronic pain. *Int J Behav Med* 2006; 13: 237–243.
8. Yosipovitch G, Greaves MW, Schmelz M. Itch. *Lancet* 2003; 361: 690–694.
9. van Os-Medendorp H, Ros WJF, Eland-de Kok PCM, Kennedy C, Thio BH, van der Schuur van der Zande A, et al. Effectiveness of the nursing programme "Coping with itch": a randomized controlled study in adults with chronic pruritic

- skin disease. *Br J Dermatol* 2007; 156: 1235–1244.
10. Ehlers A, Stangier U, Gieler U. Treatment of atopic dermatitis: a comparison of psychological and dermatological approaches to relapse prevention. *J Consult Clin Psychol* 1995; 63: 624–635.
  11. Habib S, Morissey S. Stress management for atopic dermatitis. *Behav Change* 1999; 16: 226–236.
  12. Staab D, Diepgen TI, Fartasch M, Kupfer J, Lob-Corzillius T, Ring J, et al. Age related, structured educational programmes for the management of atopic dermatitis in children and adolescents: a multicentre, randomised controlled trial. *BMJ* 2006; 332: 933–938.
  13. Gieler U, Kupfer J, Niermeier V, Brosig B, Stangier U. Atopic eczema prevention programs – a new therapeutic concept for secondary prevention. *Dermatol Psychosom* 2000; 1: 138–147.
  14. Hanifin JM, Thurston M, Omoto M, Cherill R, Tofte SJ, Graeber M. The eczema area and severity index (EASI): assessment of reliability in atopic dermatitis. *Exp Dermatol* 2001; 10: 11–18.
  15. Lorig KR, Chastain R, Ung E, Shoor S, Holman HR. Development and evaluation of a scale to measure the perceived self-efficacy of people with arthritis. *Arthr Rheum* 1989; 32: 37–44.
  16. Sullivan, MJL, Bishop SR, Pivik J. The pain catastrophizing scale: development and validation. *Psychol Assess* 1995; 7: 524–532.
  17. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI): a simple practical measure for routine clinical use. *Clin Exp Dermatol* 1994; 19: 210–216.
  18. Evers AWM, Kraaimaat FW, van Lankveld W, Jongen PJH, Bijlsma JWJ. Beyond unfavorable thinking: the Illness Cognition Questionnaire for chronic diseases. *J Consul Clin Psychol* 2001; 69: 1026–1036.
  19. British Medical Association: Royal Pharmaceutical Society of Great Britain. *British National Formulary 44*. London: British Medical Association; Royal Pharmaceutical Society of Great Britain, 2002.
  20. Cohen JL, editor. *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum, 1988.
  21. Clark D. Developing new treatments: On the interplay between theories, experimental science and clinical innovation. *Behav Res Ther* 2004; 42: 1089–1104.
  22. Stangier U, Ehlers A, Gieler U. Predicting long-term outcomes in group treatment of atopic dermatitis. *Psychother Psychosom* 2004; 73: 293–301.
  23. Evers AWM. Dermatologie [Dermatology]. In: AA Kaptein, R Beunderman, J Dekker, AJJM Vingerhoets, editors. *Psychologie en Geneeskunde – Behavioural Medicine*, 3rd edn. Houten: Bohn Stafleu Van Loghum, 2006: p. 239–256.
  24. Evers AWM, Kraaimaat FW, van Riel PLCM, de Jong AJL. Tailored cognitive-behavioral therapy in early rheumatoid arthritis for patients at risk: a randomized, controlled trial. *Pain* 2002; 100: 141–153.